

Claims

We claim is:

- 5 1. A method for screening chemical compounds, the method comprising steps of:

providing an assay format containing a plurality of reaction vessels arranged with sufficient density that individual vessels are separated from one another by no more than about 5 millimeters;

10 introducing at least one chemical compound into each of said plurality of reaction vessels;

introducing an assay system capable of undergoing at least one chemical or biological reaction into each of said plurality of reaction vessels; and

15 detecting an effect of at least one of the chemical compounds on the chemical or biological reaction.

- 20 2. The method of claim 1, wherein the step of providing an assay format comprises providing an assay format containing a plurality of reaction vessels arranged with sufficient density that individual vessels are separated from one another by no more than about 2 millimeters

- 25 3. The method of claim 1, wherein the step of providing an assay format comprises providing an assay format containing a plurality of reaction vessels arranged with sufficient density that individual vessels are separated from one another by no more than about 1 millimeters.

10. The method of claim 1, wherein the step of detecting comprises detecting an intracellular event or entity.

11. The method of claim 1, wherein the step of detecting comprises detecting a luminescent moiety.

12. The method of claim 1, wherein the step of detecting comprises detecting a chemiluminescent moiety generated by a peroxidase, and utilizes at least one antibody to bind to a biological component.

13. A method for screening chemical compounds, the method comprising steps of:

providing an assay format containing at least 100 reaction vessels;

introducing at least one chemical compound into each of said at least 100 reaction vessels;

introducing an assay system capable of undergoing at least one chemical or biological reaction into each of said at least 100 reaction vessels; and

detecting an effect of at least one of the chemical compounds on the chemical or biological reaction.

14. The method of claim 13, wherein the step of providing an assay format comprises providing an assay format containing at least 100 reaction vessels wherein a volume of each reaction vessel is less than or equal to approximately 200 microliters.

4. The method of claim 1, wherein the step of providing an assay format comprises providing an assay format containing a plurality of reaction vessels arranged with sufficient density that individual vessels are separated from one another by no more than about 0.25 millimeters.

5. The method of claim 1, wherein the step of introducing an assay system comprises introducing at least one cell into each of said plurality of reaction vessels.

6. The method of claim 5, wherein the step of introducing at least one cell comprises introducing at least one eukaryotic cell.

7. The method of claim 5, wherein the step of introducing at least one cell comprises introducing at least one mammalian cell.

8. The method of claim 5, wherein the step of introducing at least one cell comprises introducing at least one human cell.

9. The method of claim 1, wherein the step of introducing an assay system capable of undergoing at least one chemical or biological reaction, the reaction is selected from the group consisting of: nucleic acid synthesis, protein phosphorylation, protein cleavage, peptide cleavage, carbohydrate addition, carbohydrate cleavage, metabolism of cellular components, synthesis of cellular components, intracellular biochemical reactions, and combinations thereof.

15. The method of claim 13, wherein the step of providing an assay format comprises providing an assay format containing at least 300 reaction vessels wherein a volume of each reaction vessel is less than or equal to approximately 50 microliters.

16. The method of claim 13, wherein the step of providing an assay format comprises providing an assay format containing at least 1000 reaction vessels wherein a volume of each reaction vessel is less than or equal to approximately 2 microliters.

17. The method of claim 13, wherein the step of providing an assay format comprises providing an assay format containing at least 5000 reaction vessels wherein a volume of each reaction vessel is less than or equal to approximately 250 nanoliters.

18. The method of claim 13, wherein the step of introducing an assay system comprises introducing at least one cell into each of the at least 100 reaction vessels.

19. The method of claim 18, wherein the step of introducing at least one cell comprises introducing at least one eukaryotic cell.

20. The method of claim 18, wherein the step of introducing at least one cell comprises introducing at least one mammalian cell.

21. The method of claim 18, wherein the step of introducing at least one cell comprises introducing at least one human cell.

5 22. The method of claim 2, wherein the step of introducing an assay system capable of undergoing at least one chemical or biological reaction, the reaction is selected from the group consisting of: nucleic acid synthesis, protein, phosphorylation, protein cleavage, peptide cleavage, carbohydrate addition, carbohydrate cleavage, metabolism of cellular components, synthesis of cellular components, intracellular biochemical reactions, and combinations thereof.

10 23. The method of claim 2, wherein the step of detecting comprises detecting an intracellular event or entity.

15 24. The method of claim 2, wherein the step of detecting comprises detecting a luminescent moiety.

20 25. The method of claim 2, wherein the step of detecting comprises detecting a chemiluminescent moiety generated by a peroxidase, and wherein the step of detecting utilizes at least one antibody to bind to a biological component.

26. A system for identifying compounds capable of affecting a biological or chemical process, said system comprising:

a high density array of reaction vessels containing at least 100 reaction vessels; and

a collection of compounds for screening.

5 27. The system of claim 26, wherein the array of reaction vessels contains at least 300 reaction vessel wherein each vessel has a volume less than or equal to approximately 50 microliters.

10 28. The system of claim 26, wherein the array of reaction vessels contains at least 1000 reaction vessels wherein each vessel has a volume less than or equal to approximately 2 microliters.

15 29. The system of claim 26, wherein the array of reaction vessels contains at least 5000 reaction vessels wherein each vessel has a volume less than or equal to approximately 250 nanoliters.

30. A system for identifying compounds capable of affecting a biological or chemical process, said system comprising:

20 a high density array of reaction vessels containing at least 100 reaction vessels; and

an assay solution containing at least one reagent for detecting levels of component in a biological or a chemical process or resulting from a biological or a chemical process.

31. The system of claim 30, wherein the array of reaction vessels contains at least 300 reaction vessels wherein each vessel has a volume less than or equal to approximately 50 microliters, wherein the assay solution detects levels of a component in a biological or a chemical process or resulting from a biological or a chemical process by using chemiluminesce, and wherein compounds for screening are synthesis by combinatorial chemistry.

32. The system of claim 30, wherein the array of reaction vessels contains at least 1000 reaction vessels wherein each vessel has a volume less than or equal to approximately 2 microliters, wherein the assay solution detects levels of a component in a biological or a chemical process or resulting from a biological or a chemical process by using chemiluminescent compounds generated by a peroxidase, and wherein compounds for screening are synthesis by combinatorial chemistry.

33. The system of claim 30, wherein the array of reaction vessels contains at least 5000 reaction vessels wherein each vessel has a volume less than or equal to approximately 250 nanoliters, wherein the assay solution detects levels of a component in a biological or a chemical process or resulting from a biological or a chemical process by using chemiluminescent compounds generated by horseradish peroxidase, and wherein compounds for screening are synthesis by combinatorial chemistry.

34. A composition comprising one or more of the compounds depicted in Figure 16.

35. A composition comprising one or more of the compounds depicted in Figure 17.

36. The composition of claim 34 or claim 35 further comprising a pharmaceutically acceptable carrier.

37. A method of stimulating expression of TGF β -responsive genes, the method comprising steps of:

providing a system including one or more genes under the control of one or more TGF β -responsive elements; and

contacting the system with a compound having a structure as set forth in Figure 16 or Figure 17.

38. A method of altering metal concentration in a system, the method comprising:

providing a system in which metal concentration is to be adjusted; and

contacting the system with a compound having a structure as set forth in Figure 16 or Figure 17.